

CLAIMS

1. A circuit using a choke coil, comprising:

first and second signal lines via which differential
5 transmission communication is performed and on which a power
supply current goes;

third and fourth signal lines via which differential
transmission communication is performed and on which the
power supply current returns; and

10 a choke coil having second, third, and fourth windings,
and a magnetic core constituting a closed magnetic path in
which the first, second, third, and fourth windings are
wound,

wherein the first, second, third, and fourth windings
15 are electrically connected to the first, second, third, and
fourth signal lines, respectively,

the first winding and the second winding are wound in
the same direction so that magnetic fluxes generated in the
magnetic core are mutually strengthened when an in-phase
20 noise current flows, and the third winding and the fourth
winding are wound in the same direction so that magnetic
fluxes generated in the magnetic core are mutually
strengthened when an in-phase noise current flows, and

the first and second windings and the third and fourth
25 windings are wound so that magnetic fluxes generated in the

magnetic core are mutually strengthened when an in-phase noise current flows.

2. A choke coil that is inserted in a signal line having communication and power-provision functions, comprising:

first and second bobbins each having a cylindrical body portion; a first winding that is closely wound in a single layer on the cylindrical body portion of the first bobbin and a second winding that is closely wound in a single layer over the first winding;

a third winding that is closely wound in a single layer on the cylindrical body portion of the second bobbin and a fourth winding that is closely wound in a single layer over the third winding; and

a magnetic core having leg portions that are inserted through holes in the cylindrical body portions of the first and second bobbins to constitute a closed magnetic path,

wherein the first winding and the second winding are wound in the same direction so that magnetic fluxes generated in the magnetic core are mutually strengthened when an in-phase noise current flows,

the third winding and the fourth winding are wound in the same direction so that magnetic fluxes generated in the magnetic core are mutually strengthened when an in-phase noise current flows, and

the first and second windings and the third and fourth windings are wound so that magnetic fluxes generated in the magnetic core are mutually strengthened when an in-phase noise current flows.

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3. The choke coil according to Claim 2, wherein each of the first bobbin and the second bobbin includes flange portions at both ends of the cylindrical body portion, and

10 outer peripheries of the flange portions of the first bobbin are brought into contact with or engaged with outer peripheries of the flange portions of the second bobbin.

4. The choke coil according to Claim 2 or 3, wherein one of an insulating resin member, a magnetic-powder-containing
15 insulating resin member, a ferrite member whose surface is coated with insulating resin, a metal member whose surface is coated with insulating resin, and a metal member is placed between the first bobbin and the second bobbin.